

ON A NEW POLYEMBRYONIC ENCYRTID (CHALCIDOIDEA) *COPIDOSOMA TORTRICIS* SP. N. BRED FROM THE STRAWBERRY TORTRIX MOTH.

By JAMES WATERSTON, B.D., B.Sc.

(Published by permission of the Trustees of the British Museum.)

(With 5 text-figs.)

DURING the course of investigations into the life history of the Strawberry Tortrix (*Oxygrapha comariana* Z.) in 1918 and 1919, of which the results appear elsewhere (p. 6), Mr F. R. Petherbridge reared a small chalcid in numbers and was good enough to send me some of his material for study. With the hymenoptera there were fortunately enclosed two of the irregularly swollen dried skins of the hosts whose remarkable appearance (Fig. 1) at once suggested a polyembryonic



Fig. 1. Larva of *Oxygrapha comariana* Z., showing the characteristic swellings produced by the pupation of *Copidosoma tortricis* Wtrst. with holes of emergence of the parasite.

method of reproduction on the part of the parasite. Although Mr Petherbridge could supply no direct evidence on this point he had made the significant note that as many as 35 of these parasites might emerge from one larva.

Having dissected and thoroughly examined both sexes of the chalcid I came to the conclusion that it should be assigned to the genus *Copidosoma* Ratz. but neither the named material in the British Museum collection—at present in an unsatisfactory state—nor a study of Mayr's Monograph of the European Encyrtidae enabled me to determine the species. Recently I have submitted both dried specimens and various preparations of the *Copidosoma* to my friend Prof. F. Silvestri who, however, can suggest no definite name for the insect though he knows

it well, having reared a practically identical form from a *Tortrix* sp. in Italy. As Prof. Silvestri tells me he has found this *Copidosoma* to be polyembryonic in Italy I have no doubt the British form is so too.

Superfamily: CHALCIDOIDEA.

Family: ENCYRTIDAE.

Genus: **Copidosoma** Ratzeburg (1844).

Copidosoma tortricis sp. n.

Distinguished by the proportions and chaetotaxy of the antennae (♂, ♀) (Fig. 3 *a, b*) especially by the short second funicular joint (♂); the proportions of the head (Fig. 2 *b*); labrum (Fig. 2 *c*); and radius (Fig. 5). The colour of the antennae is probably also of importance.

Note. The proportions of the antennal joints must be studied in properly prepared mounts. In naturally dried specimens there is considerable distortion and the club (♀) in particular is liable to appear unduly flattened. The filamentous end of the preapical dorsal mandibular bristle (Fig. 2 *a*) is often broken off.

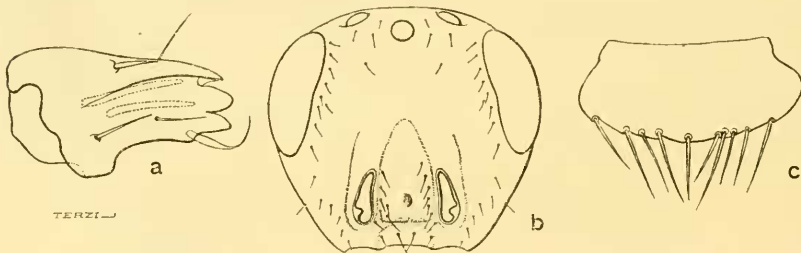


Fig. 2. *Copidosoma tortricis* Wtrst. ♀. (*a*) right mandible from inside, (*b*) head from in front, (*c*) labrum.

A dark blackish brown species in both sexes, with metallic reflections on head and thorax and submetallic on the abdomen dorsally.

♀. Reflections variable but mainly as follows. On face, frons, vertex, pronotum and scutum mainly dark green or aeneous green; on scutellum and mesopleurae (more shining) and abdomen (more dully) purplish. Outer aspect of hind coxa submetallic.

Antennae concolorous, blackish brown. Palpi paler than rest of trophi. Wings sub-hyaline very faintly and uniformly tinted; neuration brownish, indistinctly and shortly clouded at the base of the radius distally. Legs all tarsi paler, fore and hind coxae, trochanters, femora (except the extreme apex), tibiae (except for a narrow basal ring and in the fore pair sometimes the tip obscurely) blackish—the excepted portions paler. In the mid legs the coxa is dark, trochanter, base of tibia (narrowly) and apex (more broadly) paler. The main portion of the mid femur is brown, not nearly so dark as the fore or hind femora. Mid tibiae variable—as pale as the fore tarsus with an indistinct darker dorsal streak.

♂ similar to the ♀ in colour but with definitely darker legs in which the knees, tarsi and sometimes the apex of the fore tibia (obscurely) alone are paler.

♀. Head (Fig. 2 *b*), just broader than long (13 : 12). Eyes rather short and little more than half (5 : 9) the length (depth). Frons very wide, the eyes at the level of the anterior ocellus separated by about $\frac{1}{2}$ and on the base line by $\frac{7}{8}$ of the breadth. Malar space large, the malar impressed line $\frac{4}{5}$ the depth of the eye or barely half (4 : 9) that of the head. Toruli elongate, much longer (12 : 5) than broad; distant from the clypeal edge at $\frac{1}{2}$, and from one another rather over, their own length. Besides the usual short bristles along the orbits frontally, there are two (1 : 1) minute, below the anterior ocellus, 6-7 on each side between the toruli and 4 (1 : 2 : 1), stronger on the clypeus, remote from the edge. The intertorular area is somewhat tumescent. Pattern moderate, regular, distinctly but not strongly raised.

Antenna (Fig. 3 *b*). Length about 1 mm., scape and bulla together not quite half as long as the remainder of the antenna. Scape (6 : 1) nearly thrice the pedicel (7 : 4) longer than the first four joints of the funicle and about $\frac{1}{4}$ longer than the club.

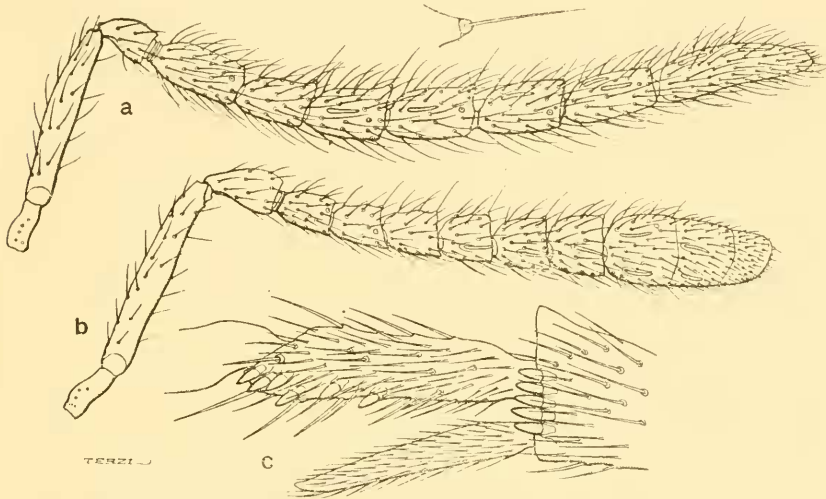


Fig. 3. *Copidosoma tortricis* Wtrst. (a) Antenna ♂, (b) antenna ♀, (c) first joint of mid tarsus and apex of tibia ♀.

Funicle expanding from the second joint onwards, sixth joint nearly as wide as the club and much broader (7 : 4) than the first, but only a little longer (9 : 8). The insertion of the funicular joints is infra median and the distal superior angle is indistinctly produced and setigerous. The club is distinctly segmented only on one side and the sensoria are few. Labrum (Fig. 3 *c*), mandibles (Fig. 3 *a*) elongate, tridentate, maxillary palpus 12 : 10 : 15 : 25. Last joint with four stouter bristles (1 median, 2 preapical, and 1 apical) at the edge (of which the last is $\frac{2}{3}$ the joint) and 14-16 finer over its surface. Labial palpus 12 : 15 : 12, apical bristle as long as the joint which bears 6-7 in all.

Thorax and propodeon subequal, both in length and breadth to the abdomen, but broader than the head. Thorax + propodeon + head shorter than antenna.

Pronotum, posterior row of about 18 bristles. Prosternum twice as broad as long. Prepectus entirely reticulate. Tegulae three bristles. Axillae not quite touching, with

one minute bristle. Scutellum, about $\frac{1}{6}$ shorter than the scutum with about 30 bristles. Propodeon extremely short spiracle small, broadly oval, situated at the extreme side where the segment is intumescent and posteriorly angulate. One or two pleural bristles and another small patch of the same behind the spiracle, the individual bristles rising from minute wart-like excrescences.

Wings, forewings (Fig. 4) (7 : 3) length 1.3 mm., on the submarginal vein 12-14 bristles. Radius (Fig. 5) with a single bristle and four terminal pustules, on the dorsal surface along the edge of the submarginal cell are about 30 bristles. Below

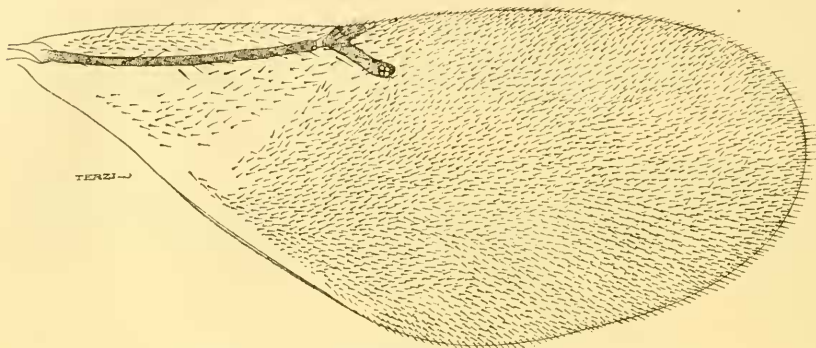


Fig. 4. *Copidosoma tortricis* Wtrst. ♀ wing.

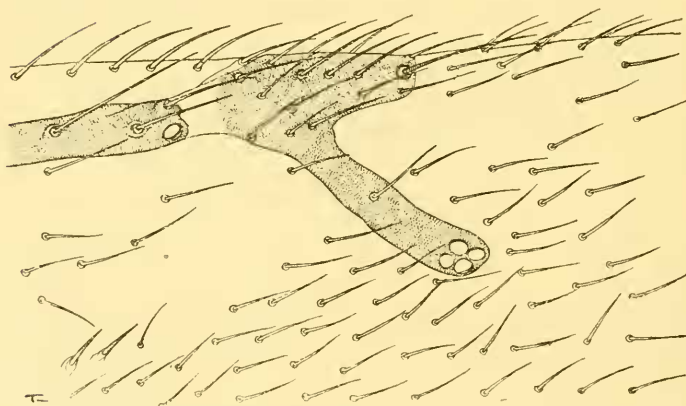


Fig. 5. *Copidosoma tortricis* Wtrst. ♀. Details of radius of wing.

nearly the whole surface of the cell is covered with bristles of which about 10 towards the apex are longer and oblique. There are 6-8 rows of bristles basally before the "hairless streak." Hind wings (7 : 2) length .8 mm. Forelegs, femur equal to tibia. The latter with comb of six rather long spines apically. Upper apical angle of tibia with one chitinous tooth anteriorly and another posteriorly, first tarsal comb of 12 spines. Proportions of first three tarsal joints, 9 : 6 : 5.

Mid leg, femur shorter (6 : 7) than tibia. Spur of the latter shorter than first tarsal joint (Fig. 3 c). Heavy spines on apex of tibia 5, on tarsus 6, 4, 4, 2, 0, respec-

tively. Tarsus, 14 : 7 : 6. Hind legs, femur shorter (5 : 6) than tibia, comb of the latter 10 spines, longer spur $\frac{5}{8}$ of the first tarsal joint, second very short about $\frac{1}{4}$ of the first. Tarsus 12, 8, 7.

Abdomen. Along the mid line the first tergite exceeds all except the seventh, which is slightly longer, 2-4 and 6 are subequal, 5 longer. Setigerous process half as broad again as long, with 3 long and 1 shorter seta. Distance between the processes greater (3 : 2) than the longest seta or (3 : 1) than the distance from either process to the spiracle. The latter minute, circular, 12-14 bristles distally on spiracular overiap. Pattern of abdomen raised and coarser anteriorly on first tergite, smoother posteriorly and medianly. Terebra distinctly shorter than its sheath. Distal portion of the latter ($\frac{5}{8}$ the base) with one bristle. 3-4 bristles apically on the pleural flap above.

Length 1.3 mm.

Alar expanse, 3 mm.

♂. Head, broader than long (nearly 5 : 4) much broader relatively than in ♀. The base line of the eyes cuts off the upper $\frac{1}{4}$ of the toruli. The latter at their nearest separated by more than, and from the clypeal edge by $\frac{2}{5}$ of, their own length.

Antenna (Fig. 3 a), length 1.1 mm. Scape over thrice the pedicel equal to the first two and $\frac{1}{3}$ of the third funicular joints together. Funicle of practically equal width but widest on the third joint with the unsegmented club tapered apically. The second joint is the shortest.

Throughout the antenna bears numerous moderately strong fuscous bristles which are more or less curved apically. At the upper distal angle (in profile) of each funicular joint and about the middle of the dorsal edge of the club is a tubercle (very conspicuous on joints 2-4) emitting a single characteristic fine *hyaline* bristle. Being neither coloured nor apically curved, these bristles in spite of their fineness are exceedingly conspicuous. There are few sensoria.

Thorax and propodeon together shorter than abdomen.

Wings. Forewings a little over twice as long as broad, about the same length (1.3 mm.) as in the ♀ but broader. Hind wings slightly more (22 : 7) than three times as long as broad.

Forelegs, tibia just shorter than femur.

Abdomen, tergite 7 longest—half as long again as 1.

Last sternite apically broadly emarginate. Genitalia. Basal plate with 6-7 bristles on each side. Paramer bidentate, rather slender, about $\frac{2}{3}$ the breadth of the plate in length.

Dimensions much as in ♀ the abdomen however slightly longer.

Type ♀ in Brit. Mus. one of a series (♂, ♀) bred from larva of *Oxygrapha* (*Peronea*) *comariana*, Z., England, Cambridge, Summer 1918 and 1919 (F. R. Petherbridge).

(The figures illustrating this paper are reproduced by permission of the Ministry of Agriculture.)